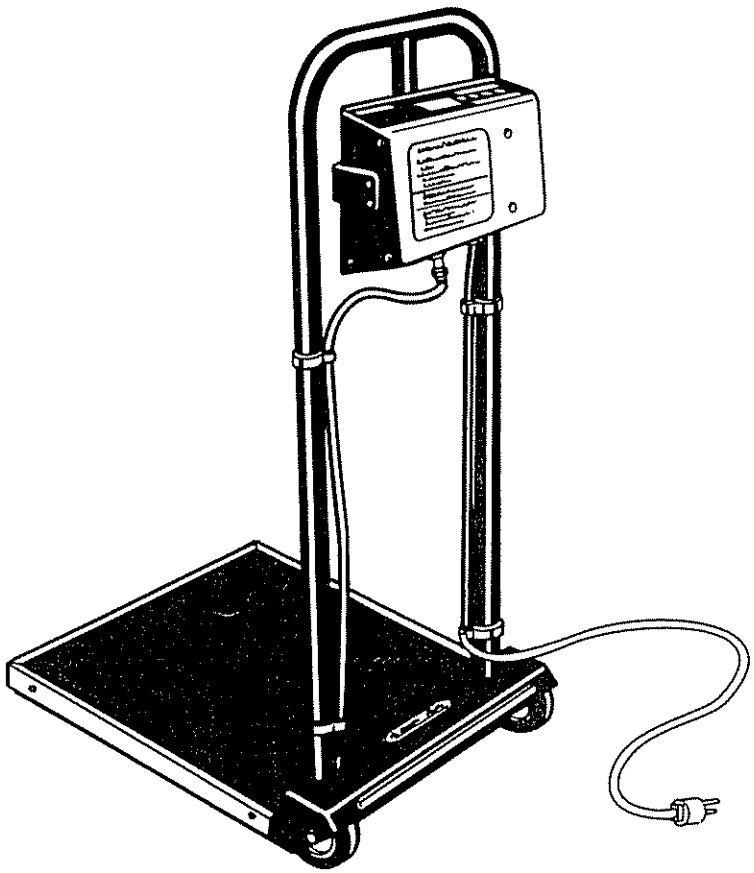
Pro Plus

MOTION DETECTION SYSTEM

MODEL 2101



Stand-On Scale

OPERATOR'S MANUAL

Healthometer®
MEDICAL

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1.0 INTRODUCTION

Health o meter's complete Pro Plus line of electronic scales use the most sophisticated microprocessor technology available. Each precision instrument is designed to provide accurate, reliable and repeatable weight measurements, as well as many other features which make the weighing process simple, fast and convenient.

This operation manual contains instructions for use. In order to achieve satisfactory results the operator must read this manual thoroughly before attempting to use this scale. If there are any questions on this scale or its use, please contact Health o meter.

2.0 WARRANTY

Your Pro Plus Electronic Scale has been thoroughly inspected and tested in accordance with the rigid specifications of Health o meter Inc.

Health o meter warrants that this Pro Plus Electronic Scale shall be free from defects in material and workmanship for a period of two (2) years from the date of purchase. This warranty covers all components of this Pro Plus scale, with the exception of the battery pack. The battery pack is warranteed for one (1) year.

Health o meter's obligation under this warranty is limited to the repair or replacement of defective parts or, at the discretion of Health o meter, the complete replacement of the scale.

This warranty does not apply to scales that have been altered, subject to apparent misuse, abuse, accident, unauthorized repair or operated other than in accordance with the instructions. Health o meter must be notified promptly and within the warranty period of the existence of a defect. Health o meter shall have the sole right to determine whether a defect exists.

This warranty is the exclusive obligation of Health o meter, and the exclusive remedy of the purchaser regarding defects in the scale. Health o meter makes no other warranties expressed or implied. No person is authorized to modify in any manner Health o meter's obligation as described above.

In the event of questions relating to this warranty or to report defects in the unit, please contact:

Health o meter Medical
Technical Service Department
7400 West 100th Place • Bridgeview, Illinois 60455
1-800-638-3722 • 1-708-598-9100 (IL.)

3.0 CAUTIONS AND WARNINGS

Cautions

- To ensure proper operation of the Pro Plus Electronic Scale, this operator's manual should be reviewed carefully before operation. Keep this manual available for future reference, and also for use in the orientation of new personnel.
- Use only the appropriate connecting cable designed specifically for use with this monitor. If the cabling provided with this unit becomes cracked or damaged, it should be repaired or replaced immediately.
- If the scale becomes damaged, it should not be operated until properly serviced. All repairs should only be performed by authorized Health o meter service personnel.
- Scales are designed for static weighing of patients only. **No scale should be used for patient transfer. Health o meter assumes no responsibility for patient injury nor scale damage should this caution be ignored.**
- **Do not leave patients unattended while on the scale.**

Warnings

Failure to comply with the following will void scale warranty.

- Do not gas sterilize or autoclave the scale.
- Do not place liquids on top of the scale read-out console.
- Do not exceed recommended weight limit of **600 lb./272.2 kg** for this scale.
- Scales contain delicate sensors. Do not bang into doors, elevators, etc., as damage may result.

4.0 ASSEMBLY INSTRUCTIONS

4.1 GENERAL

A. Carefully inspect all cartons for shipping damage before unpacking. If Damage is found, contact your shipper or Health o meter immediately. Claims must be filed with the shipper as soon as possible after receipt of the damaged package.

B. **IMPORTANT:** After assembly of the scale, charge the battery in the control box using procedure in Section 5. This will restore any power lost during storage and shipment.

4.2 ASSEMBLY OF STAND-ON SCALE
(Figure 1)

4.2.1 ASSEMBLING THE SCALE

1. The contents of the carton are as follows:

   A. Handlebar with Control Box

   B. Platform with Wheels

   C. Hardware

2. Remove the handlebar from the carton and place it to one side. Remove all boxes and packing material.

3. Lift the platform out the carton and place on the floor.

4. Turn the platform up on its front edge.

5. Thread the control cable with connector through the right (as you stand on the platform) handlebar mounting hole in the wheel cover (Figure 2.) Insert the cable into the keyway in this mounting hole.

6. Lay the platform down. Insert the handlebar into the two (2) mounting holes in the wheel cover. Make certain the control cable is seated into the keyway (Figure 3.)

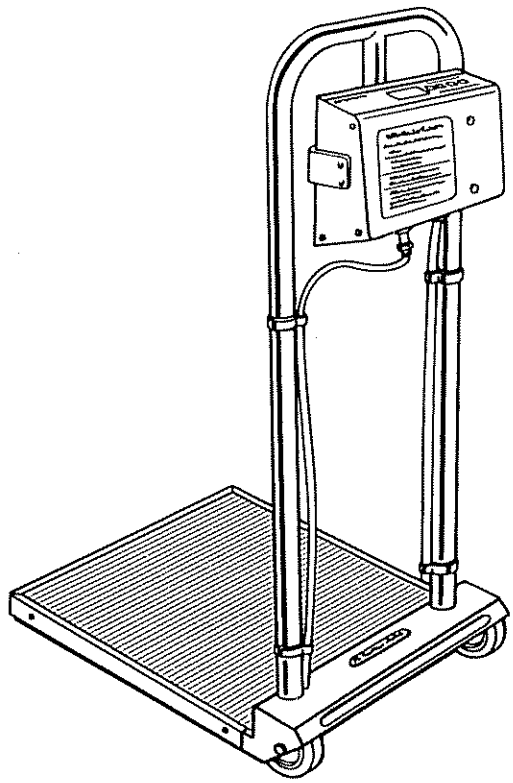


FIGURE 1

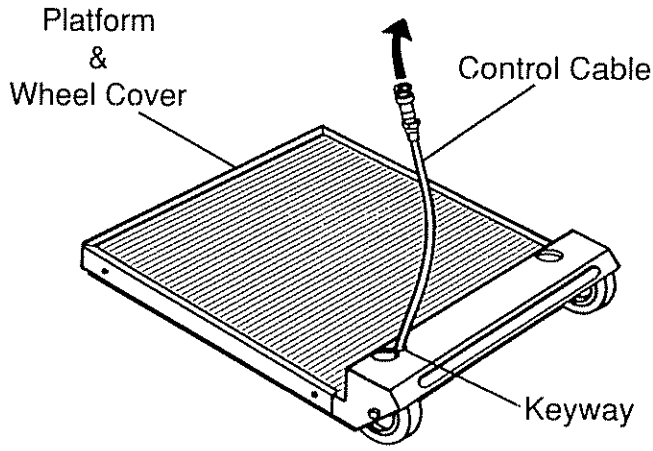


FIGURE 2

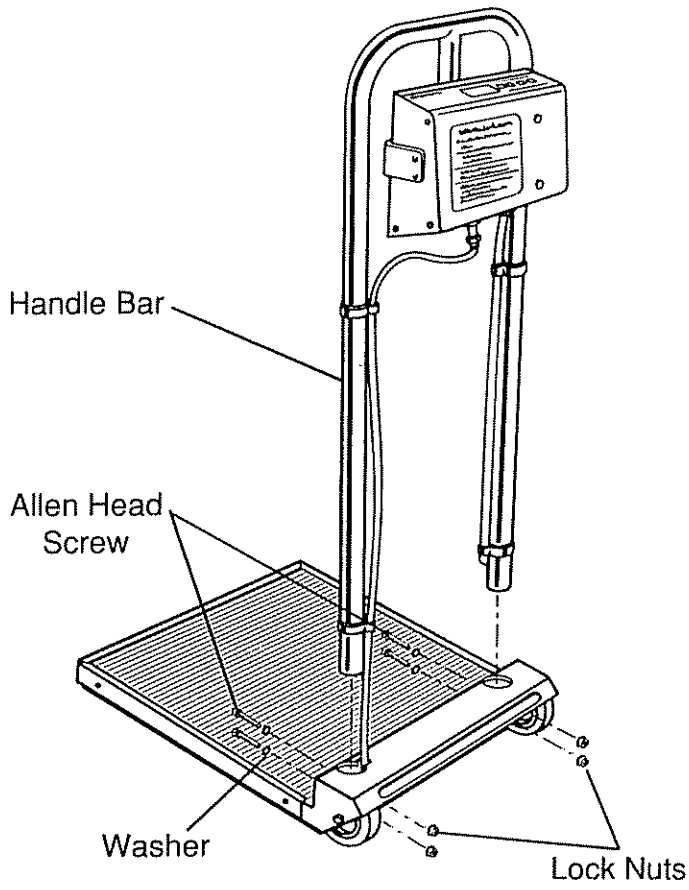


FIGURE 3

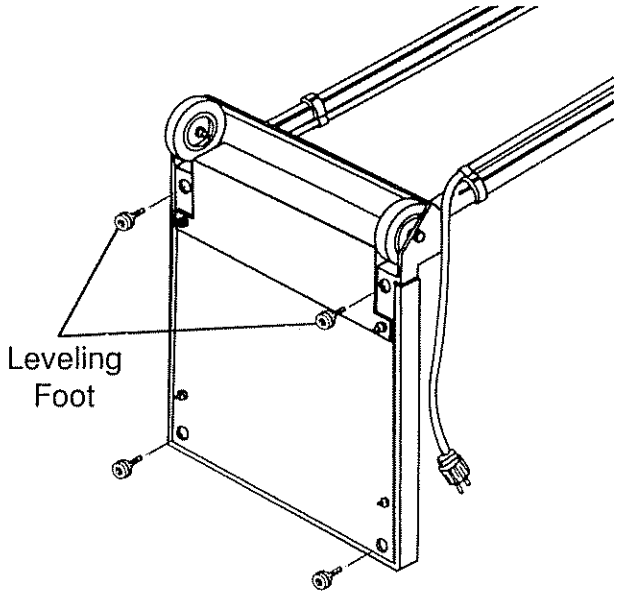


FIGURE 4

7. Line up the holes in the handlebar with the holes in the wheelcover and fasten using four (4) 1/4-20 allen head screws, washers, and lock nuts. Tighten using the supplied allen wrench.

8. Tilt the scale on its front edge and rest the handlebar on the floor. Screw a leveling foot into each corner in the bottom of the platform until about 1/4" of thread is showing (Figure 4.)

9. Turn the scale upright on its feet and level or adjust the height of the platform by turning each foot in or out of the platform. Turning the foot into the platform will decrease the platform height in that corner. Turning the foot out of the platform wil increase the platform height in that corner. **NOTE:** Adjust the platform height so that the platform bottom edge or wheels do not touch the floor or carpet.

10. Attach the control cable to the bottom of the control box and clip the cable to the right handrail with the supplied clips.

11. Clip the power cable to the left handrail with the supplied clips. Wrap the excess cable around the control box.

5.0 BATTERY CHARGING

5.1 GENERAL

The rechargeable battery used in this scale is similar to the no-maintenance lead-acid batteries used in automobiles. No maintenance means that since the battery is sealed, no checking of water level or adding of water to the battery is necessary. However, recharging at proper intervals and proper storage procedures are necessary, as in an automobile battery.

A fully charged battery will provide approximately 250 normal weighings before requiring recharging. When the display flashes "Lo-b", the battery needs to be recharged.

5.2 TO CHARGE THE BATTERY

A. Plug the battery charger power cord into a 120 **VAC** outlet.

B. The battery will fully charge in 8 hours. THE SCALE MAY BE USED WHILE THE BATTERY IS CHARGING.

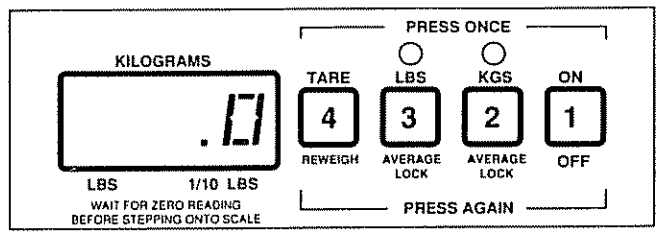
NOTE: The battery cannot be overcharged with the specially designed charger built into this scale.

Optimum battery life will be obtained if the scale is operated and stored connected to 120 VAC. *Always check plug to see if scale is charging before moving.*

If the scale is not connected to 120 VAC and is to be stored for an extended period of time, it should be stored with a fully charged battery, preferably in a cool place. The battery should be charged every three months. A discharged battery should be recharged as soon as possible or its useful life will decrease significantly. A discharged battery left in the scale can leak and cause permanent damage to the battery and scale.

6.0 PRODUCT DESCRIPTION

6.1 PANEL CONTROLS



The Pro Plus console panel has four membrane switches (1 through 4 on figure above). Switches 2 through 4 have both primary and secondary functions as described below.

SWITCH	PRIMARY FUNCTION	SECONDARY FUNCTION
1 On/Off	Depress to turn scale on or off	
2 Kilo	Depress to display weight in kilograms (light over switch will illuminate to indicate kilogram mode	While in kilo mode, depress for Average reading when excessive movement prevent stationary measurement Depress after any reading to "Lock" reading Reading remains displayed for approximately 1 minute after patient is removed from scale, or until switch is depressed again Kilo light will flash to indicate average or locked reading.
3 Lbs	Depress to display weight in pounds mode (light over switch will illuminate to indicate pounds mode)	Depress while in pound mode to average reading. Depress after any reading in pounds mode to "lock" in reading Light will flash to indicate average or locked reading.
4 Tare	Zeros readout (tares out the weight of foreign object, e g , blanket. placed on platform)	Depress after initial weight is taken to reweigh individual

6.2 SPECIAL FEATURES

The Health o meter Pro Plus scales come standard with the following special features for convenience and simple operation.

1. **Autozero:** The scale will automatically come to zero when turned on.

   If a foreign object is placed on the platform before turning the scale on, it will automatically zero (tare) out that object's weight.

2. **English-Metric Readout:** You may switch between metric and English readouts before or after a reading, and the scale will convert one reading to the other.

3. **Recalculate Weight:** If the operator is uncomfortable with the first reading of a patient's weight, a second reading can be taken without removing the patient from the scale. To reweight the patient, simply depress the "Tare/Reweigh" button.

4. **Average Weight:** For most patients, the Pro Plus Scale will display an actual weight based on a series of consistent stable measurements. However, for a few patients, consitent movement or artifact prevents the scale from obtaining the readings required to give a "stable weight." On these patients an average weight can be determined by depressing the Lbs. (or Kilo) switch (dependent upon measurement mode).

5. **Tare ability:** The operator can "tare out" (zero out) the weight of a blanket, etc., upon which a patient is to be weighed.

6.3 PHYSICAL CHARACTERISTICS AND SPECIFICATIONS

Dimensions

Height	42"
Width	19"
Length	23"
Weight (no package included)	62 lbs.

Power Requirements

Input Power	120 VAC/60 Hz
Rechargeable Battery	8 Volt
Minimum Charge Life	500 Readings
Recharge time 8 Hours	

Operating Conditions

Temp./Humidity. Normal Room Temp. and Humidity

Scale Description

Type	Strain Gauge
Maximum Capacity	600 lb./272.2 kg.
Resolution	0.1 lb./100 gm.
Accuracy	±0.1 lb./100 gm.
Max Tare Weight	12.5 lb./5.6 kg.

7.0 OPERATING INSTRUCTIONS

7.1 ZEROING OUT (TARING) THE WEIGHT OF BLANKETS, ETC.

There are (2) methods that can be used to zero out (tare out) the weight of a blanket, etc.

A. 1. Start with the scale on and a display reading of "0".

2. Place the blanket, etc on the scale and depress the TARE/REWEIGH button (#4) to rezero the display.

NOTE: Maximum tare capability when the scale is used in this mode is 12.5 lb./5.6 kg. EXCEEDING THIS WEIGHT LIMIT WHEN TARING WILL RESULT IN THE SCALE REWEIGHING THE OBJECT RATHER THAN ZEROING IT OUT. FOR OBJECTS IN EXCESS OF 12.5 LB./5.6 KG. USE METHOD B.

B. 1. Start with the scale in the off mode.

2. Place the object on the scale.

3. Turn the scale on. The scale will now automatically zero out (tare out) the weight of the object leaving a zero reading on the display.

7.2 TAKING A WEIGHT MEASUREMENT

1. Obtain a " 0 " reading by one of the two above mentioned methods.

2. Have the patient step on to the scale platform.

3. The moving dashes will lock in and display the patient's actual weight.

- The weight will automatically be displayed in the English mode (pounds). If kilograms are required push the KGS button (#2).

- If a reweigh is required, push the REWEIGH button (#4) and the scale will make another actual weight calculation.

NOTE: Excessive patient movement may sometimes prevent a computer determined repeatable reading. If the moving dashes persist, press the AVERAGE LOCK button (for the appropriate lbs. or kilo mode) to obtain an average reading of the patient's weight. THIS READING IS AN INSTANTANEOUS AVERAGE OF WEIGHT THE COMPUTER "SEES" AND MAY VARY SLIGHTLY FROM THE **EXACT** WEIGHT.

4. After the weight measurement is obtained, have the patient step off the scale.

5. Depress the ON/OFF button (#1) to turn the scale off.

8.0 CARE AND MAINTENANCE

8.1 GENERAL

Proper care and cleaning of all Health o meter Pro Plus scales and accesories is essential to ensure a long life of accurate and effective operation.

8.2 CLEANING

Disconnect the scale from 120 **VAC**.

1. All external surfaces can be wiped clean with a damp cloth or tissue. Mild soap and water solution may be used. Wipe unit dry with a clean, soft cloth.

2. **DO NOT** immerse control box console into cleaning or other liquid solution.

3. Do not use isopropyl alcohol or other solutions to clean surface of console.

4. Check overall apperance of the total scale for any obvious damage, wear and tear.

8.3 CALIBRATION

NOTE: Your scale has been accurately calibrated at the factory. However, there is always a possibility that calibration has been changed due to jarring in shipping. The following simple procedure should be followed to check and/or correct any error in calibration.

1. Depress On/Off switch on scale and wait for a display of zero.

2. Place an accurately known weight on the platform.

3. If display is other than known weight, then scale is out of calibration.

4. Calibration adjustments are behind the two black plugs on the side of the control box console.

5. Remove the two black plugs.

6. Turn the calibration adjstment knobs in increments of 1/2 turn.

NOTE: The top knob is for fine adjustment and the bottom for macro adjustment.

NOTE: Fine adjustment knob is opposite that of the macro adjustment—clockwise if too heavy and counterclockwise if too light.

7. Remove weight and depress "Tare" switch. Wait for a display reading of zero. Again add known weight to platform. If reading is correct, no further adjustments are necessary. If reading is incorrect, repeat steps 6 and 7 until a correct reading is obtained.

9.0 TROUBLESHOOTING GUIDE

Should you encounter problems with your scale, the following guide will help you in solving those problems which are most common.

	PROBLEM		SOLUTION
1	Incorrect patient weight readings	1A	Platform too low and hitting platform feet or carpet Increase platform height See paragraph 8 and 9 of section 4 2 1
		1B	Person, other than person being weighed. touching or leaning on scale handlebar
2	Display flashes "Lo-b"	2	Recharge battery See Section 5
3	Patient weight readings consistently too high or too low	3	Check scale calibration and calibrate if necessary See Section 8 3

COMPUTER BOARD

LOCATION	DESCRIPTION OF PART	LOCATION	DESCRIPTION OF PART
R1	Res CF 3 9K 1/4w 5%	C13	Cap Cer 22pF 50V
R2	Res CF 2 7 1/4w 5%	C14	Cap Ele 4 7uF 50V
R3	Res CF 1K 1/4w 5%	C15	Cap Tan 1uF 35V
R4	M OX 47 1w	C16	Cap PS ax .0047uF 50V
R5	Res CF 1K 1/4w 5%	C17	Cap Cer .001uF 50V
R6	Res CF 120 1/4w 5%	C18	Cap Mon Cer 1uF 25V
R7	Res CF 22 1/4w 5%	C19	Cap Mon Cer 1uF 25V
R8	Res CF 27K 1/4w 5%	C20	Cap PC ax .1uF 100V
R9	Res CF 27K 1/4w 5%	C21	Cap Mon Cer 47uF 25V
R10	Res CF 27K 1/4w 5%	C22 X1	Crystal 6 00 MHz
R11	Res CF 27K 1/4w 5%	RN1	Res Net 47
R12	Res CF 10 1/4w 5%	Q1	Trans PNP Power 2N6728
R13	Res CF 560 1/4w 5%	Q2	Trans PNP Power 2N6728
R14	Res CF 560 1/4w 5%	Q3	Trans PNP Power 2N6728
R15	Res CF 1K 1/4w 5%	Q4	Trans PNP Power 2N6728
R16	Res CF 27K 1/4w 5%	Q5	Trans PNP Power TIP32
R17	Res CF 2 2K 1/4w 5%	Q6	Trans NPN Gen MPS3704
R18	Res CF 33K 1/4w 5%	Q7	Trans PNP Power TIP32
R19	Res CF 470K 1/4w 5%	Q8	Trans PNP Gen MPS3702
R20	Res CF 3 9K 1/4w 5%	Q9	Trans PNP Gen MPS3704
R21	Res CF 3 9K 1/4w 5%	Q10	Trans PNP Gen MPS3704
R22	Res CF 33K 1/4w 5%	Q11	Trans PNP Gen MPS3704
R23	Res CF 33K 1/4w 5%	Q12	Trans PNP Gen MPS3704
R24	Res CF 33K 1/4w 5%	Q13	Trans PNP Gen MPS3704
R25	Res CF 3 9K 1/4w 5%	Q14	Trans PNP Gen MPS3704
R26	Res CF 3 9K 1/4w 5%	Q15	Trans PNP Gen MPS3704
R27	Res CF 150K 1/4w 5%	Q16	Trans PNP Gen MPS3704
R28	Res CF 15K 1/4w 5%	Q17	Trans PNP Gen MPS3704
R29	Res CF 33K 1/4w 5%	Q18	Trans PNP Gen MPS3704
R30	Res CF 68K 1/4w 5%	Q19	Trans PNP Gen MPS3704
R31	Res CF 33K 1/4w 5%	Q20	Trans PNP Gen MPS3704
R32	Res CF 33K 1/4w 5%	J1	IC Socket 16 Pin
R33	SELECTED VALUE	J2	Header 2 Pin 156c
R34	Res MF 324K 1/4w 1%	J3	Header 2 Pin .156c
R35	Res MF 402K 1/4w 1%	J4	Header 3 Pin 100c (2 Req)
R36	Res MF 402K 1/4w 1%	J5	Header 5 Oin .156c
R37	Res CF 2 2K 1/4w 5%	CR1	Diode Signal IN4148
R38	Res CF 10K 1/4w 5%	CR2	Diode Zener 9 1V IN4739A
R39	Res CF 3 3M 1/4w 5%	CR3	Diode Rec 600V IN4005
R40	Res CF 10K 1/4w 5%	CR4	Diode Rec 600V IN4005
*R41	Res MF 402K 1/4w 1%	CR5	Diode Rec 600V IN4005
*R42	Res MF 402K 1/4w 1%	CR6	Diode Rec 600V IN4005
R43	Res CF 27K 1/4w 5%	CR7	Diode Signal IN4148
R44	Res MF 4 02K 1/4w 1%	CR8	Diode Rec 600V IN4005
R45	Res MF 4 02K 1/4w 1%	CR9	Diode Rec 600V IN4005
R46	Res CF 27K 1/4w 5%	CR10	Diode Rec 600V IN4005
R47	Res CF 15K 1/4w 5%	CR11	Diode Rec 600V IN4005
R48	Res MF 2 00K 1/4w 1%	CR12	Diode Rec 600V IN4005
R49	Res MF 9 31K 1/4w 1%	CR13	Diode Rec 600V IN4005
VR1	Pot 1K 1 Turn	CR14	Diode Signal IN4148
VR2	Pot 25K 20 Turn	U1	IC Regulator 5V 7805
C1	Cap Ele 470uF 25V	U2	IC Regulator 5V 7805
C2	Cap Ele 4 7uF 50V	U3	IC Micro Processor 8748
C3	Cap Tan 1uF 35V	U4	IC Dual OP AMP LM358N
C4	Cap Cer 22pF 50V	U5	IC Hex Invert Buff CD4049UBE
C5	Cap Cer 100pF 25V	U6	IC Quad Bilat SW CD4016BE
C6	Cap Ele 47uF 16V	U7	IC Dual OP AMP LM358N
C7	Cap Ele 470uF 25V	U8	IC OP AMP ICL7652CPD
C8	Cap Cer .1uF 25V	U9	IC Dual Comparator LM393N
C9	Cap My 47uF 100V	U3	IC Socket 40 Pin
C10	Cap ele 47uF 16V	Q7	Heat Sink TO-220
C11	Cap Ele 100uF 25V		Screw 4-40 x 3/8 (4)
C12	Cap Ele 470uF 25V		Nut 4-40 Keps (4)

*VALUE MAY CHANGE DEPENDING ON GAIN REQUIREMENTS OF SCALE MODEL

COMPUTER BOARD

LOCATION	DESCRIPTION OF PART	LOCATION	DESCRIPTION OF PART
D1	Optical 7-Seg –Red MAN 4710A	J1	Cable Assm 16 Pin DRB to DIP 15 Inch
D2	Optical 7-Seg –Red MAN 4710A	J2	Header 6 Pin 100c
D3	Optical 7-Seg –Red MAN 4710A	R1	Res Film 120 1/4w 5%
D4	Optical 7-Seg –Red MAN 4710A	R2	Res Film 120 1/4w 5%
D1	IC Socket 14 Pin Low-Pro	Q1	Trans NPN Gen MPS 3704
D2	IC Socket 14 Pin Low-Pro		Jumper 6 22ga
D3	IC Socket 14 Pin Low-Pro		Jumper 6 22ga
D4	IC Socket 14 Pin Low-Pro		Jumper 6 22ga
D5	Optical Discrete–Red LT4223		PCB SCALE–DISPLAY
D6	Optical Discrete–Red LT4223		

10.0 ELECTRONIC SCHEMATICS